DINOSAURS!

•DISCOVER THE GIANTS OF TH

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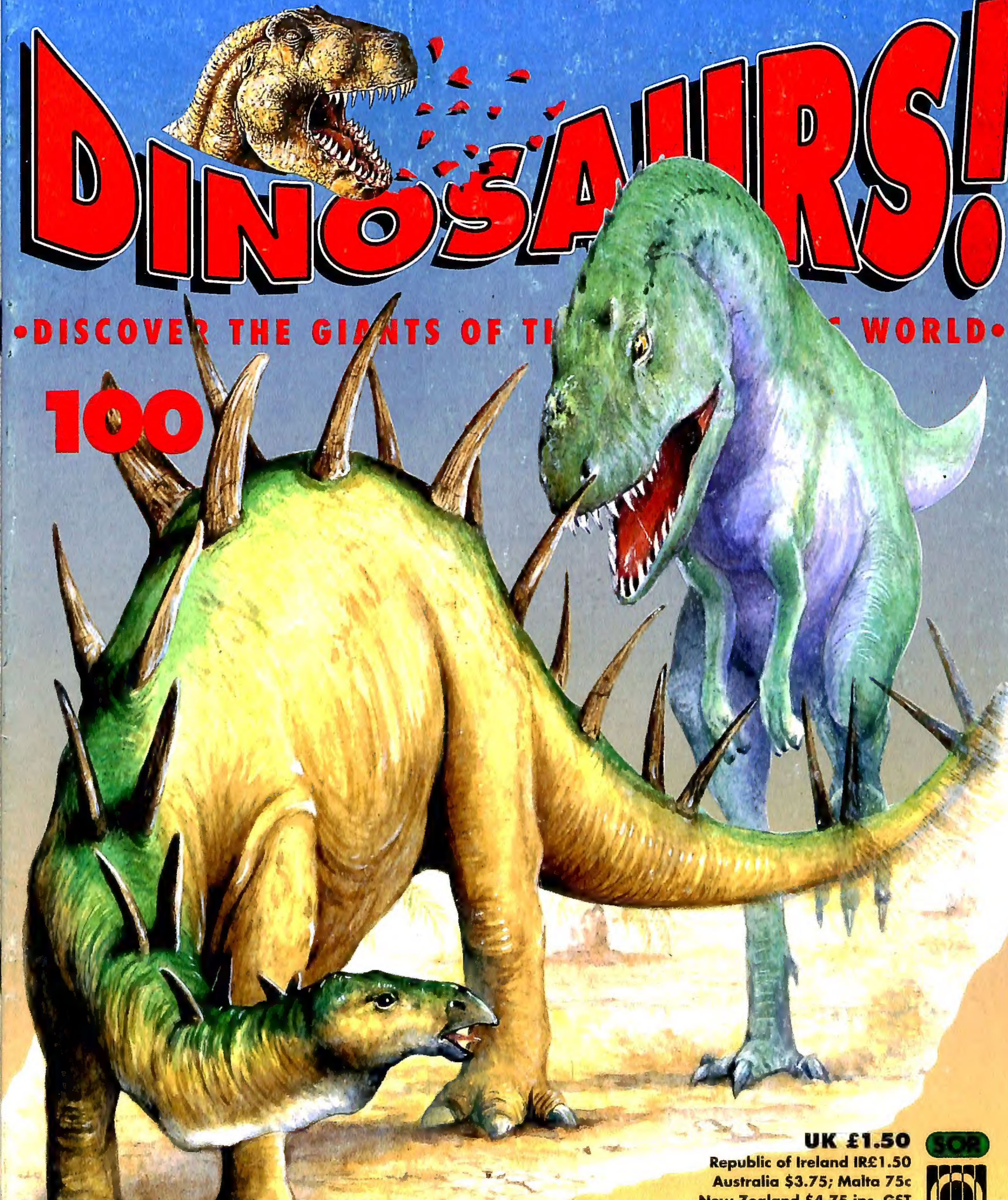

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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DINOSAURS! is published by
Orbis Publishing Ltd
Griffin House
161 Hammersmith Rd
London W6 8SD

© 1995 Orbis Publishing

EDITORIAL & DESIGN by
Tucker Slingsby Ltd
3G London House
66-68 Upper Richmond Rd
London SW15 2RP

N100 95 03 02
ISBN 0 7489 3124 4

Printed in Italy by Officine Grafiche De Agostini, Novara

CHIALINGOSAURUS

Spiky-backed *Chialingosaurus* was heavily armed against attack.

Chialingosaurus was one of the earliest stegosaurs. These extraordinary-looking dinosaurs had backs bristling with pointed plates of bone. The stegosaurs evolved about 170 million years ago and spread right across the world.

LITTLE AND LARGE

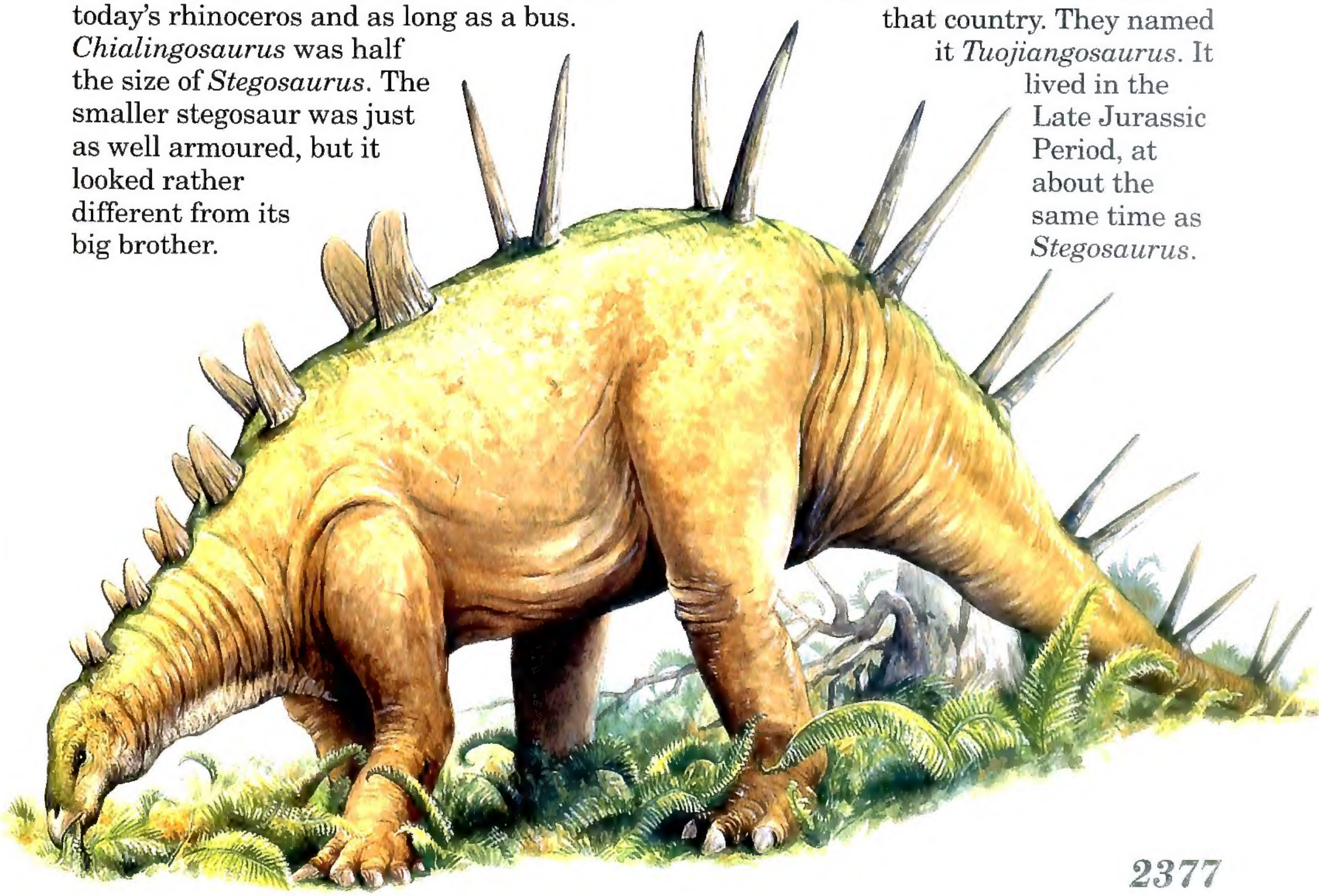
The stegosaurs got their names from giant *Stegosaurus*, which was about as heavy as today's rhinoceros and as long as a bus. *Chialingosaurus* was half the size of *Stegosaurus*. The smaller stegosaur was just as well armoured, but it looked rather different from its big brother.

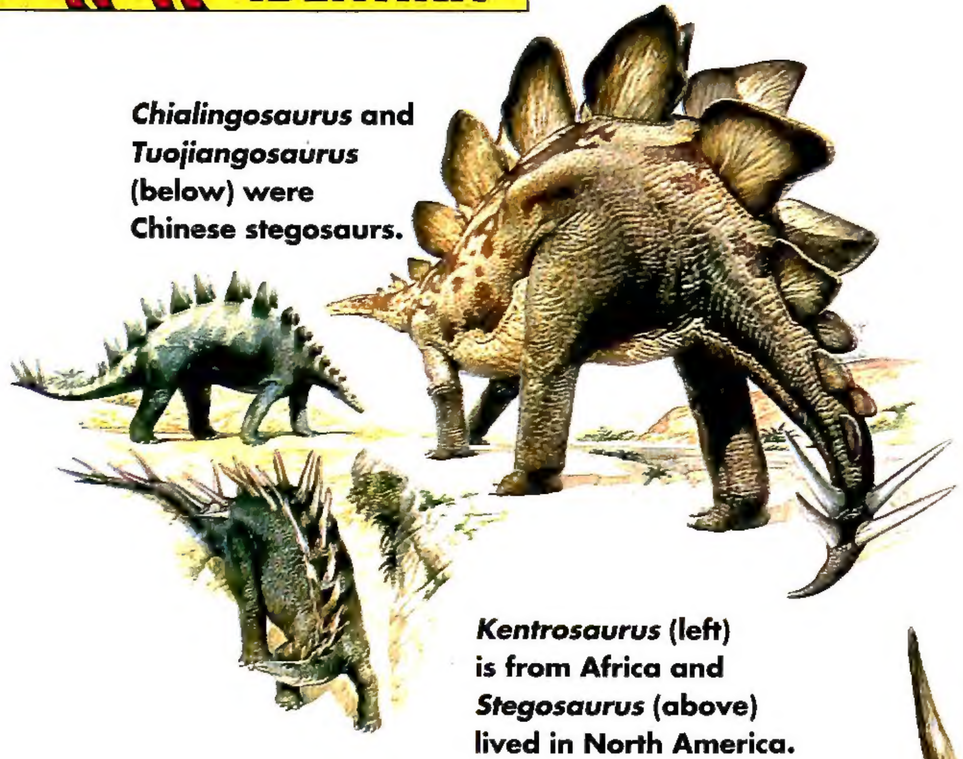
FAR AND WIDE

Many fossil remains of *Stegosaurus* have been found in North America. The stegosaurs were a very successful and widespread group of plant-eaters. Their fossilized bones have been discovered as far apart as North America and East Asia. *Chialingosaurus* is one of several different stegosaurs unearthed in China.

RECORD BREAKER

In the 1920s, experts were excited to find an almost complete stegosaur in southern China. It was one of the first dinosaur skeletons to be discovered in that country. They named it *Tuojiangosaurus*. It lived in the Late Jurassic Period, at about the same time as *Stegosaurus*.





Chialingosaurus **and *Tuojiangosaurus* (below) were Chinese stegosaurs.**

Kentrosaurus **(left) is from Africa and *Stegosaurus* (above) lived in North America.**

MORE STEGOSAURS

Since then, the fossil remains of two other stegosaurs, as well as *Chialingosaurus*, have been excavated in China. They are *Wuerhosaurus* and *Huayangosaurus*.

CHINESE PUZZLE

Scientists have been able to reconstruct *Tuojiangosaurus* by carefully piecing together all the bones discovered. But they have had to guess how *Chialingosaurus* might have looked. Only a few scattered fossils have been found so far. So this stegosaur remains a bit of a mystery, but it probably looked rather like *Kentrosaurus*, a small-spined stegosaur from Africa.

BACK TO BACK

Chialingosaurus was smaller and less bulky than *Tuojiangosaurus*. Experts believe its body armour looked rather different, too. *Tuojiangosaurus* had a double row of cone-shaped bony plates along its back. *Chialingosaurus* probably had two rows of similar plates at the front, but they may have turned into a double row of bony spikes further along the back.

Chialingosaurus **was not an easy target for predators such as *Yangchuanosaurus*. With a swipe of its spiked tail, the plant-eater could injure attackers badly.**

IT'S A FACT

LOOK-ALIKE

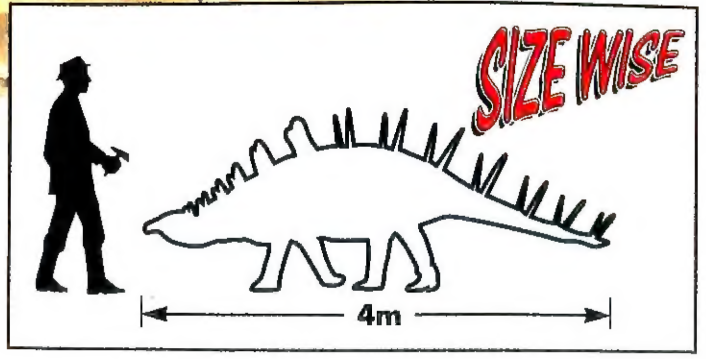
Experts think *Chialingosaurus* looked like a stegosaur discovered in Tanzania nearly 100 years ago. This dinosaur, called *Kentrosaurus*, had triangle-shaped plates along the first half of its back, then spiky plates along the second half.

DOWN BY THE RIVERSIDE

The stegosaurs looked menacing but they were peaceful plant-eaters. *Chialingosaurus* probably plodded along the river banks, feeding on lush ferns and juicy cycads. It would have nipped off low-growing twigs and shoots with its sharp beak and swallowed them almost whole.

SPIKED!

Chialingosaurus moved too slowly to outrun an attacker. So the stegosaur must have relied on its body armour to save its skin. A well-aimed swipe with its spiked tail would have toppled most predators. *Chialingosaurus* may even have backed into an enemy and speared it, just as a porcupine does today.



MONSTER FACTS

- **NAME:** *Chialingosaurus* (chy-lin-go-saw-rus) means 'lizard from Chialing river'
- **GROUP:** dinosaur
- **SIZE:** 4m long
- **FOOD:** plants
- **LIVED:** about 160 million years ago in the Middle Jurassic Period in China

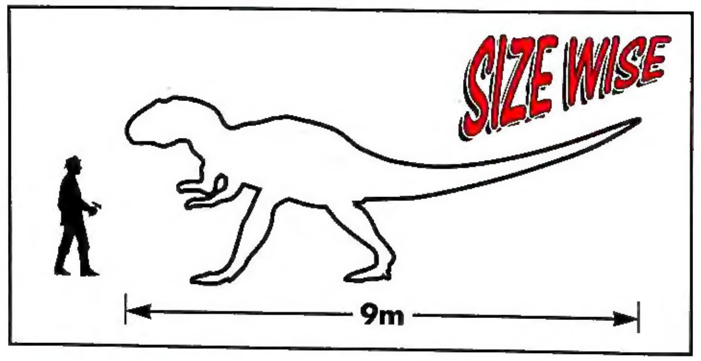
AFROVENATOR

***Afrovenator*, a fierce meat-eating dinosaur, was found in Africa.**

Scientists were thrilled to discover the fossilized bones of a fearsome flesh-eater, similar to mighty *Allosaurus*, in the Sahara Desert in 1993. They called it *Afrovenator*, which means 'African hunter'.

LATE ARRIVAL

The discovery of *Afrovenator* is exciting because it proves that allosaurs survived for much longer in Africa than anywhere else. Giant *Allosaurus* ruled the plains of North America in Late Jurassic times. Most of the allosaurs flourished at the same time. But *Afrovenator* lived several million years later, in the Early Cretaceous Period.

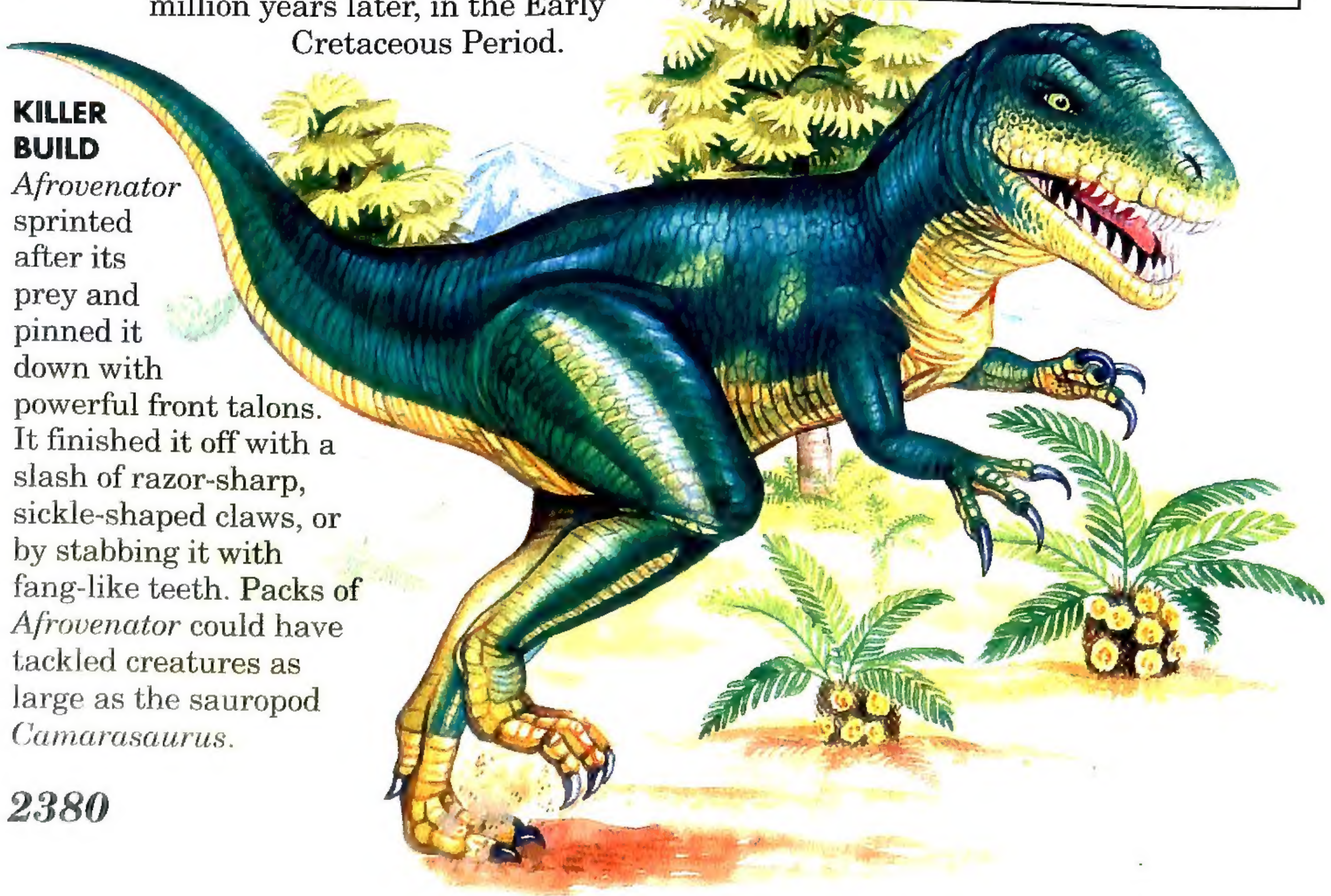


MONSTER FACTS

- **NAME:** *Afrovenator* (af-roe-ven-ate-or) means 'African hunter'
- **GROUP:** dinosaur
- **SIZE:** 9m long
- **FOOD:** meat
- **LIVED:** about 140 million years ago in the Early Cretaceous Period in Africa

KILLER BUILD

Afrovenator sprinted after its prey and pinned it down with powerful front talons. It finished it off with a slash of razor-sharp, sickle-shaped claws, or by stabbing it with fang-like teeth. Packs of *Afrovenator* could have tackled creatures as large as the sauropod *Camarasaurus*.



DINOHYUS

This huge prehistoric pig would have gobbled up any food it found.

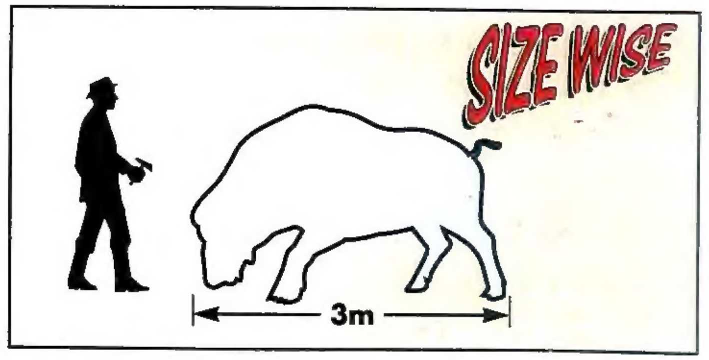
Dinohyus was a member of the entelodontid ('en-tell-oh-don-tid') family. They were large, pig-like animals that evolved 40 million years ago, spread all over the world, and died out 35 million years later.

IN AT THE END

Dinohyus was one of the last of the entelodontids. It appeared in Early Miocene times, about 25 million years ago, and died out 20 million years later.

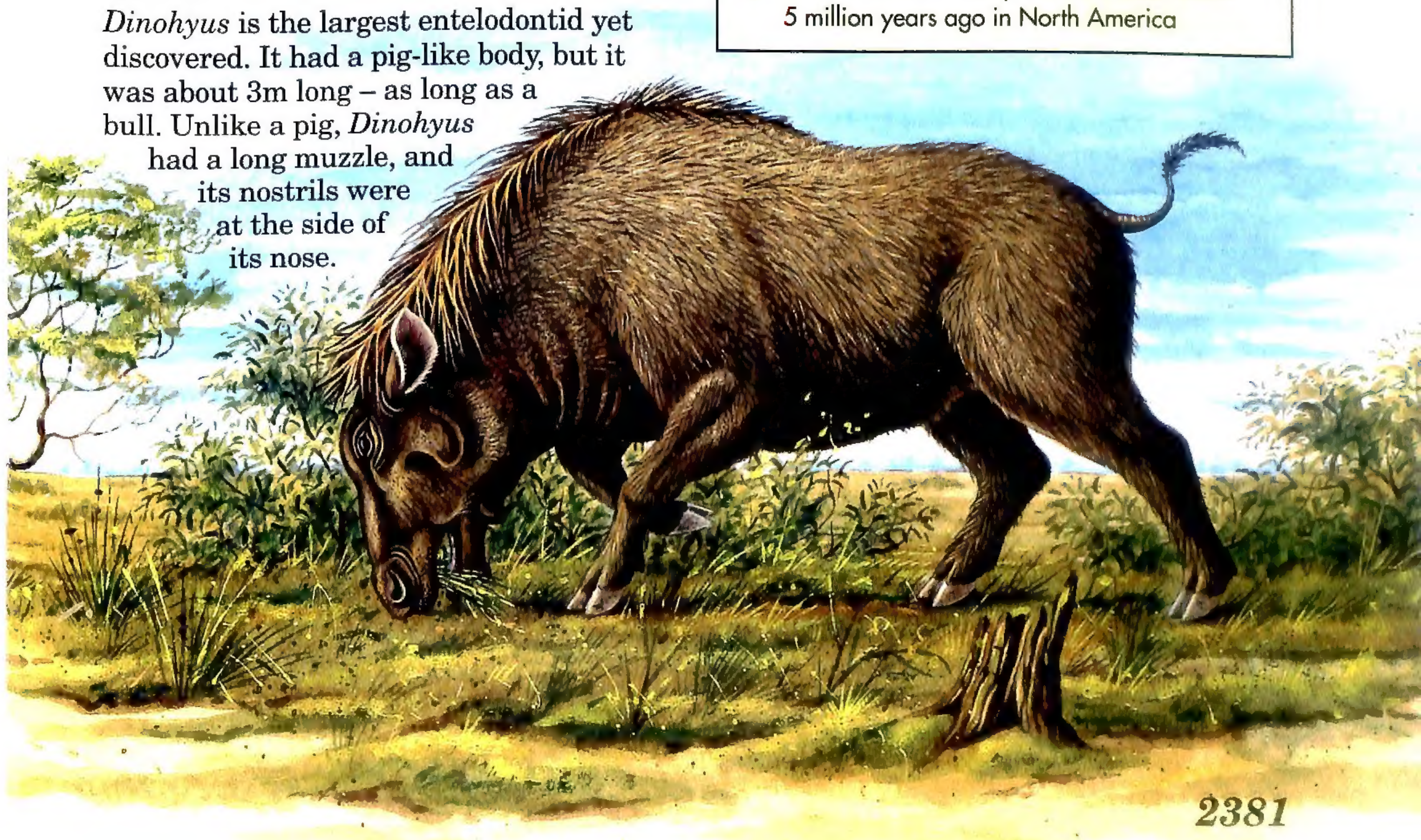
BIG PIG

Dinohyus is the largest entelodontid yet discovered. It had a pig-like body, but it was about 3m long – as long as a bull. Unlike a pig, *Dinohyus* had a long muzzle, and its nostrils were at the side of its nose.



MONSTER FACTS

- **NAME:** *Dinohyus* (die-no-hi-us) means 'terrible pig'
- **GROUP:** mammal
- **SIZE:** 3m long
- **FOOD:** plants, meat
- **LIVED:** from the Early Miocene until about 5 million years ago in North America



Masters of the Mesozoic

Some of the biggest and most spectacular reptiles of all time lived in the second half of the Mesozoic Era.

This lasted 80 million years, from the middle of the Jurassic to the end of the Cretaceous. During this time, the land was ruled by dinosaurs, the seas by marine reptiles, and the skies by pterosaurs and then the first birds.

DAY OF THE SAUROPODS

The sauropods lumbered across the green, tropical land. The plants they liked eating thrived in the steamy climate. With such a good food supply, sauropods became larger and larger until they were as big as a land animal can ever be.

SAVED BY A SPIKE

There were smaller plant-eaters, too. Where there are plenty of plant-eaters, there are meat-eaters to hunt them down. Some herbivores, such as *Stegosaurus*' relative *Tuojiangosaurus*, had spikes to protect themselves from predators such as *Yangchuanosaurus*.

Is it true that the largest flying animal ever was alive at the end of the Mesozoic?

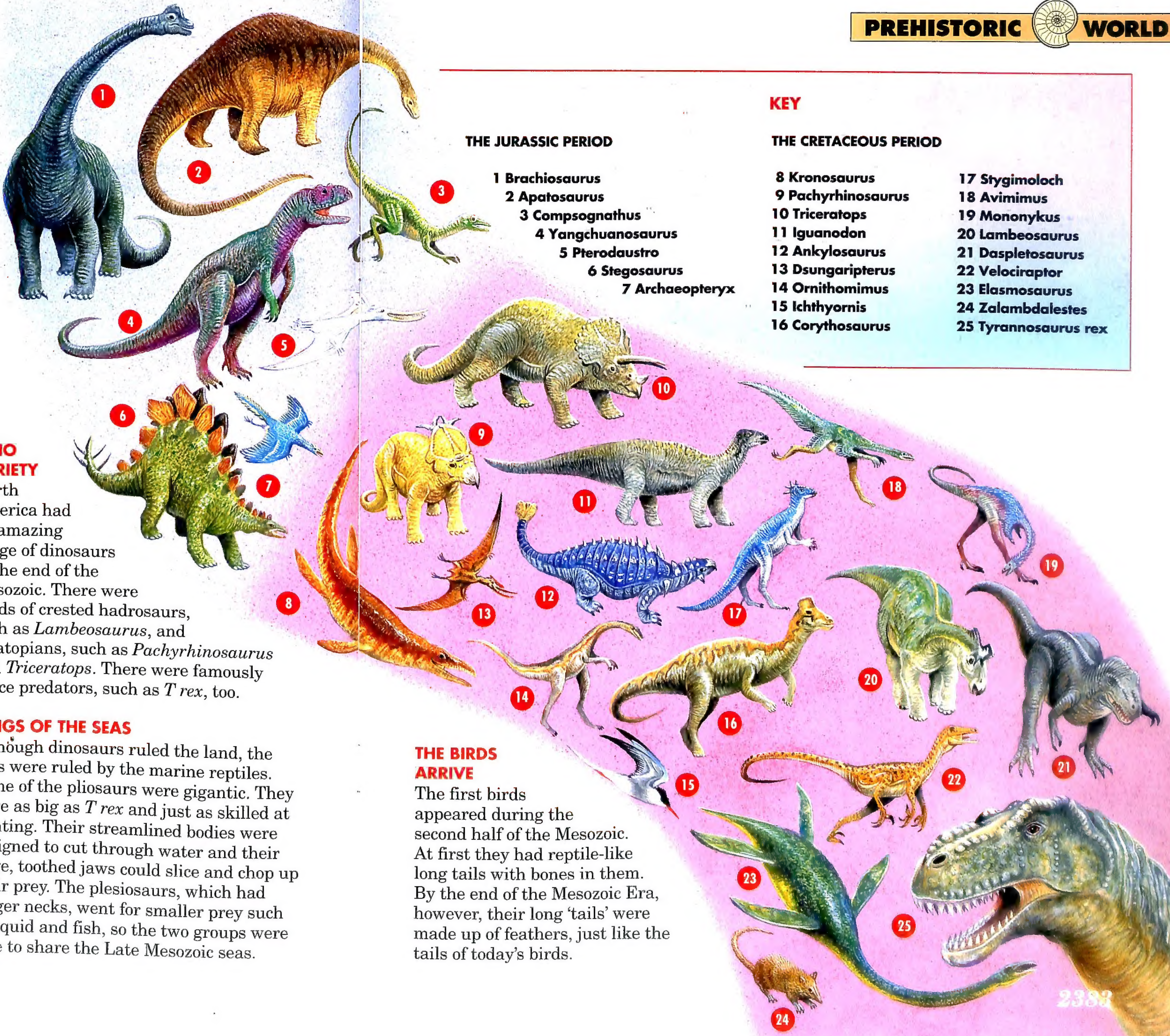
Yes. This animal was a pterosaur called *Quetzalcoatlus*. It soared above the Cretaceous landscape of southern North America and had an incredible wingspan of around 11m.

DINO VARIETY

North America had an amazing range of dinosaurs at the end of the Mesozoic. There were herds of crested hadrosaurs, such as *Lambeosaurus*, and ceratopians, such as *Pachyrhinosaurus* and *Triceratops*. There were famously fierce predators, such as *T rex*, too.

KINGS OF THE SEAS

Although dinosaurs ruled the land, the seas were ruled by the marine reptiles. Some of the pliosaurs were gigantic. They were as big as *T rex* and just as skilled at hunting. Their streamlined bodies were designed to cut through water and their huge, toothed jaws could slice and chop up their prey. The plesiosaurs, which had longer necks, went for smaller prey such as squid and fish, so the two groups were able to share the Late Mesozoic seas.



KEY

THE JURASSIC PERIOD

1 Brachiosaurus
2 Apatosaurus
3 Compsognathus
4 Yangchuanosaurus
5 Pterodaustro
6 Stegosaurus
7 Archaeopteryx

THE CRETACEOUS PERIOD

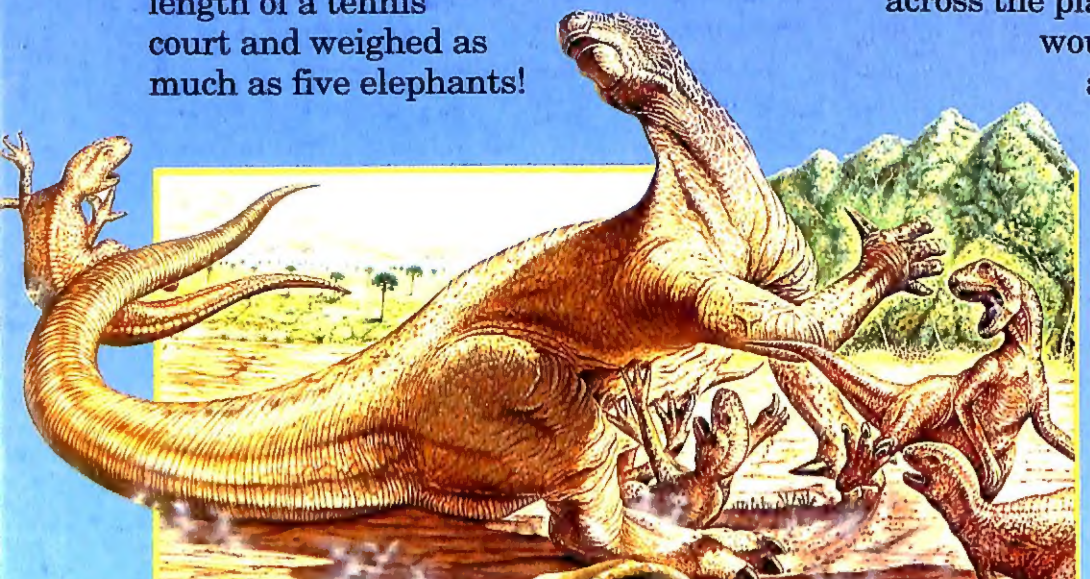
8 Kronosaurus
9 Pachyrhinosaurus
10 Triceratops
11 Iguanodon
12 Ankylosaurus
13 Dsungaripterus
14 Ornithomimus
15 Ichthyornis
16 Corythosaurus
17 Stygimoloch
18 Avimimus
19 Mononykus
20 Lambeosaurus
21 Daspletosaurus
22 Velociraptor
23 Elasmosaurus
24 Zalambdalestes
25 Tyrannosaurus rex

THE BIRDS ARRIVE

The first birds appeared during the second half of the Mesozoic. At first they had reptile-like long tails with bones in them. By the end of the Mesozoic Era, however, their long 'tails' were made up of feathers, just like the tails of today's birds.

THE AMBLING MONSTERS

Sauropods lived all over the world during the Late Mesozoic. *Brachiosaurus* was one of the largest dinosaurs. *Apatosaurus* was not as big, but was still the length of a tennis court and weighed as much as five elephants!



Iguanodon fights off a pack of Deinonychus.

MESOZOIC SAFARI

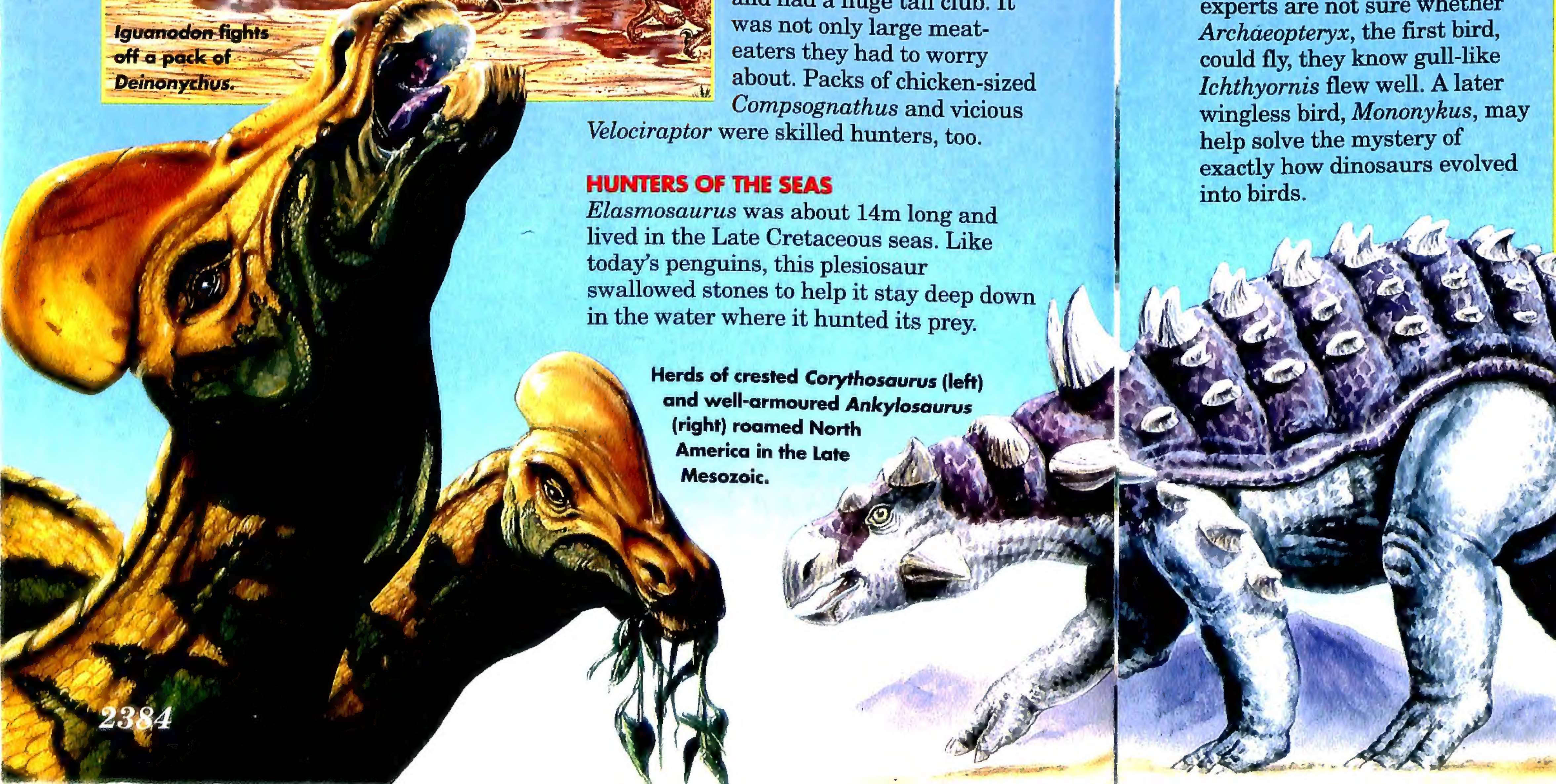
If you could go to Late Mesozoic North America, you might see *Stygimoloch* males in head-butting battles, or speedy *Avimimus* and *Ornithomimus* running across the plains. One of the great sights would be herds of *Corythosaurus* and *Lambeosaurus*. All of these dinosaurs were food for big carnivores such as *T rex* and *Daspletosaurus*.

ON GUARD

Some Mesozoic plant-eaters had incredible armour and weapons. *Iguanodon* had thumb spikes and *Ankylosaurus* was covered in bony plates and sharp spikes, and had a huge tail club. It was not only large meat-eaters they had to worry about. Packs of chicken-sized *Compsognathus* and vicious *Velociraptor* were skilled hunters, too.

HUNTERS OF THE SEAS

Elasmosaurus was about 14m long and lived in the Late Cretaceous seas. Like today's penguins, this plesiosaur swallowed stones to help it stay deep down in the water where it hunted its prey.



Herds of crested *Corythosaurus* (left) and well-armoured *Ankylosaurus* (right) roamed North America in the Late Mesozoic.

BIG MOUTHS

The great monster of the Late Mesozoic seas was a pliosaur called *Kronosaurus*. Pliosaurs could eat bigger prey than plesiosaurs because they had longer, wider heads. They probably tore and twisted chunks off prey as today's crocodiles do.

THE MESOZOIC SKIES

Pterosaurs soared in the skies during the second half of the Mesozoic. Argentinian *Pterodaustro* was about the size of a large seagull, but fed like a flamingo. Another unusual Mesozoic pterosaur was *Dsungaripterus*, which lived in China.

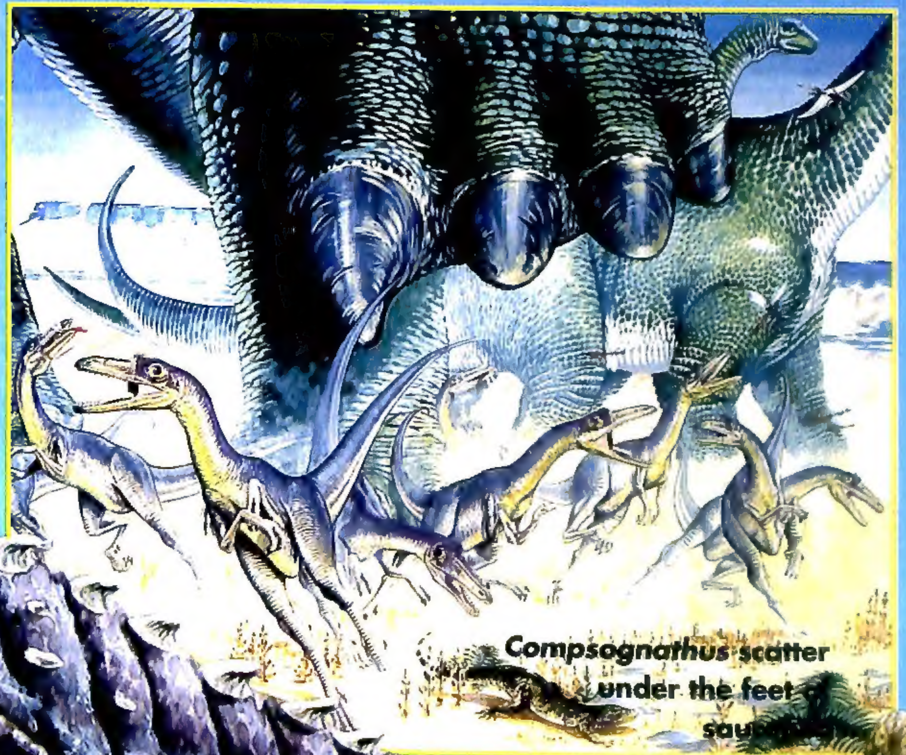
MISSING LINK

The first birds appeared in the Late Mesozoic. Although experts are not sure whether *Archaeopteryx*, the first bird, could fly, they know gull-like *Ichthyornis* flew well. A later wingless bird, *Mononykus*, may help solve the mystery of exactly how dinosaurs evolved into birds.

IT'S A FACT

READY TO RULE

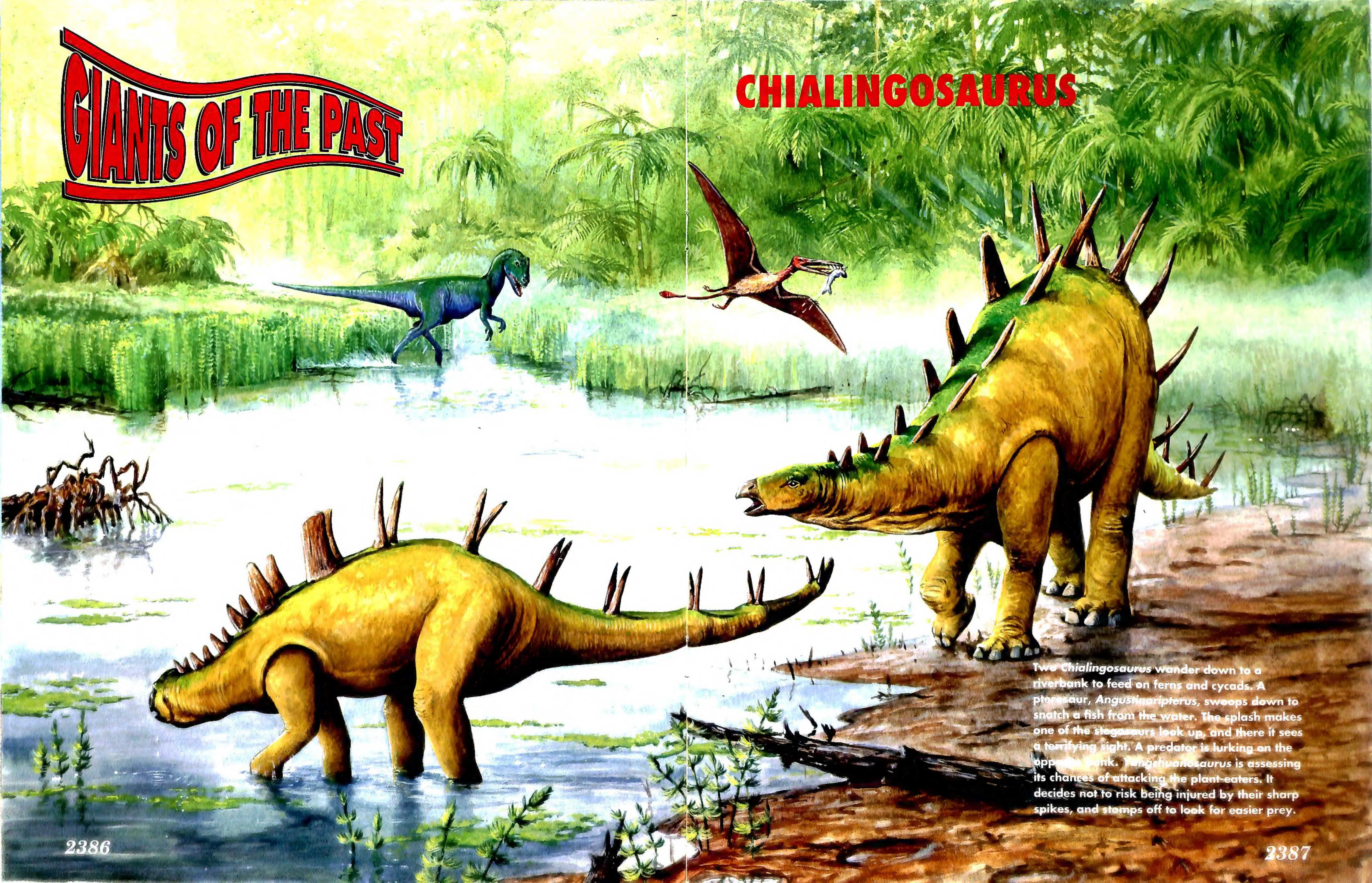
In contrast to the magnificent beasts of the Late Mesozoic, tiny *Zalambdalestes* had only sharp teeth to protect it. It may have been small, but it was a mammal. As you know, the mammals took over when the pterosaurs, plesiosaurs and dinosaurs died out at the end of the Mesozoic.



Compsognathus scatter under the feet o sau

GIANTS OF THE PAST

CHIALINGOSAURUS

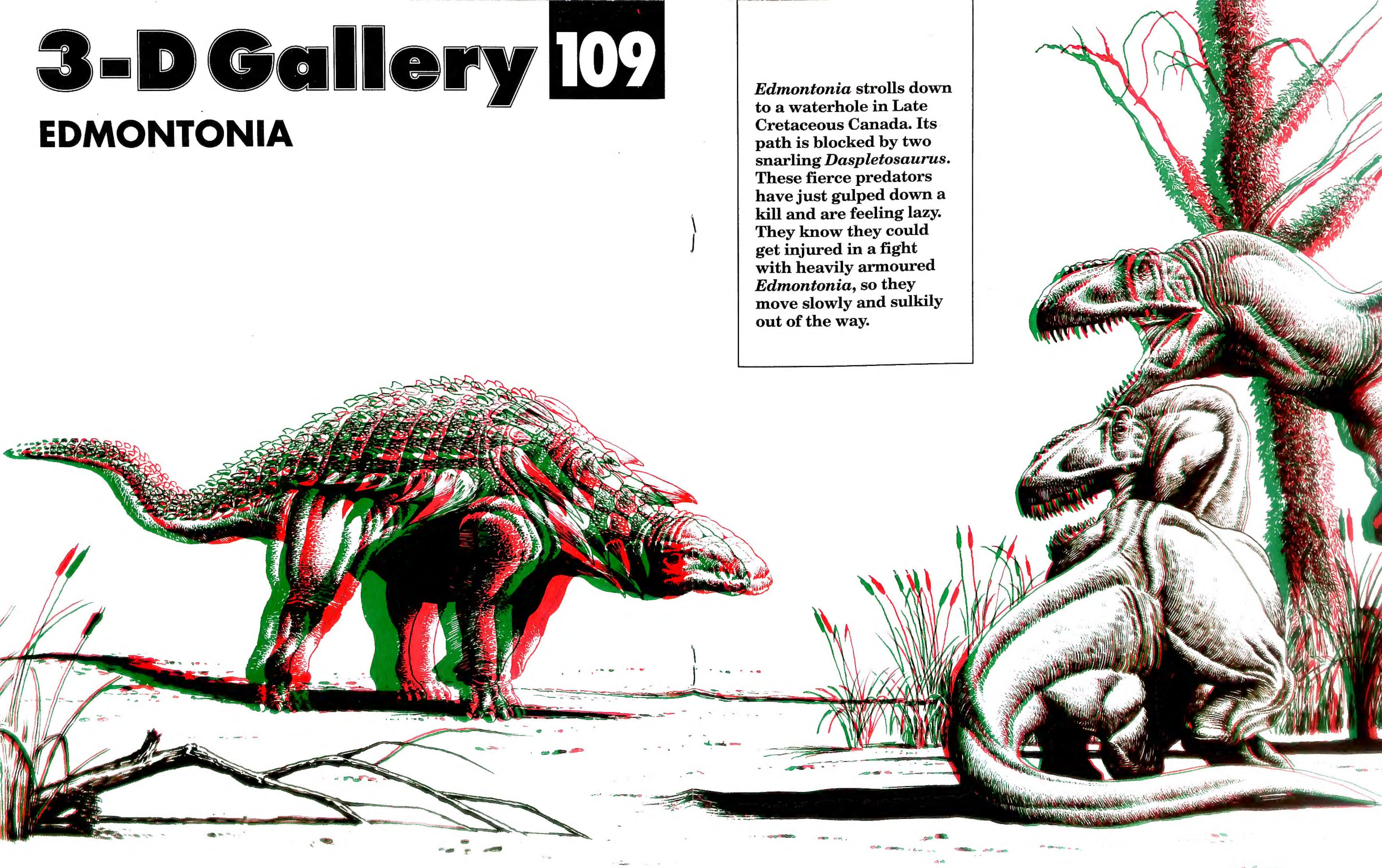


Two *Chialingosaurus* wander down to a riverbank to feed on ferns and cycads. A pterosaur, *Angustinaripterus*, sweeps down to snatch a fish from the water. The splash makes one of the stegosaurs look up, and there it sees a terrifying sight. A predator is lurking on the opposite bank. *Yangchuanosaurus* is assessing its chances of attacking the plant-eaters. It decides not to risk being injured by their sharp spikes, and stomps off to look for easier prey.

3-D Gallery 109

EDMONTONIA

Edmontonia strolls down to a waterhole in Late Cretaceous Canada. Its path is blocked by two snarling *Daspletosaurus*. These fierce predators have just gulped down a kill and are feeling lazy. They know they could get injured in a fight with heavily armoured *Edmontonia*, so they move slowly and sulkily out of the way.



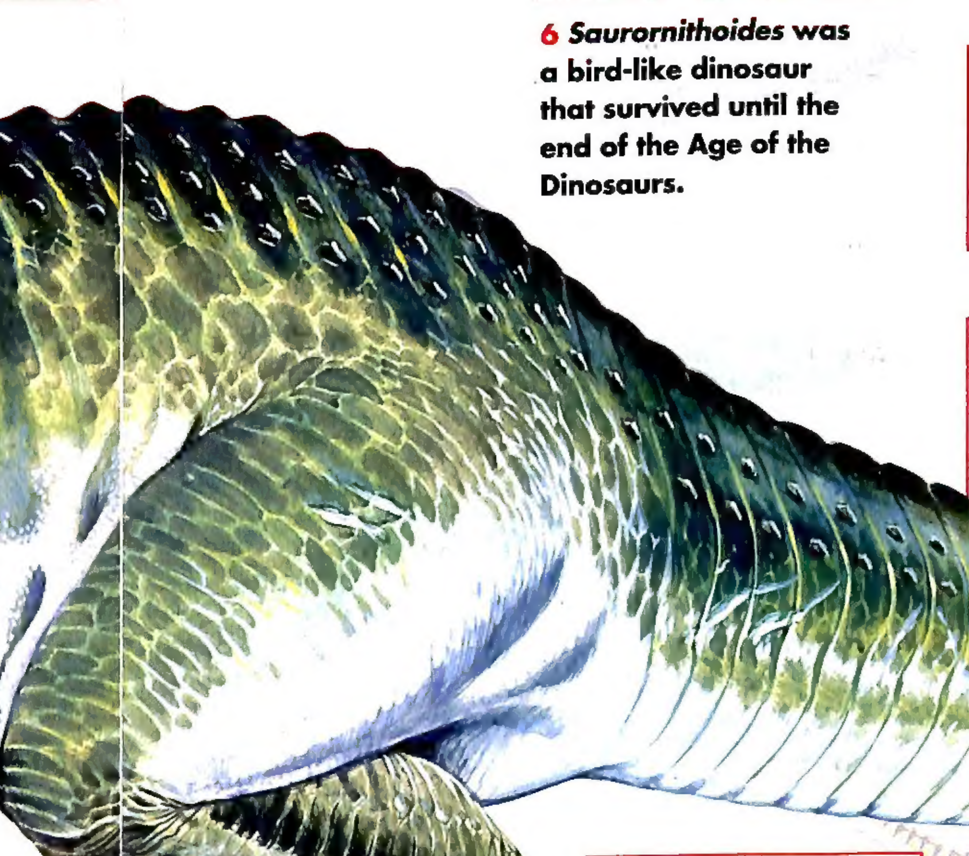
Beastly neighbours?

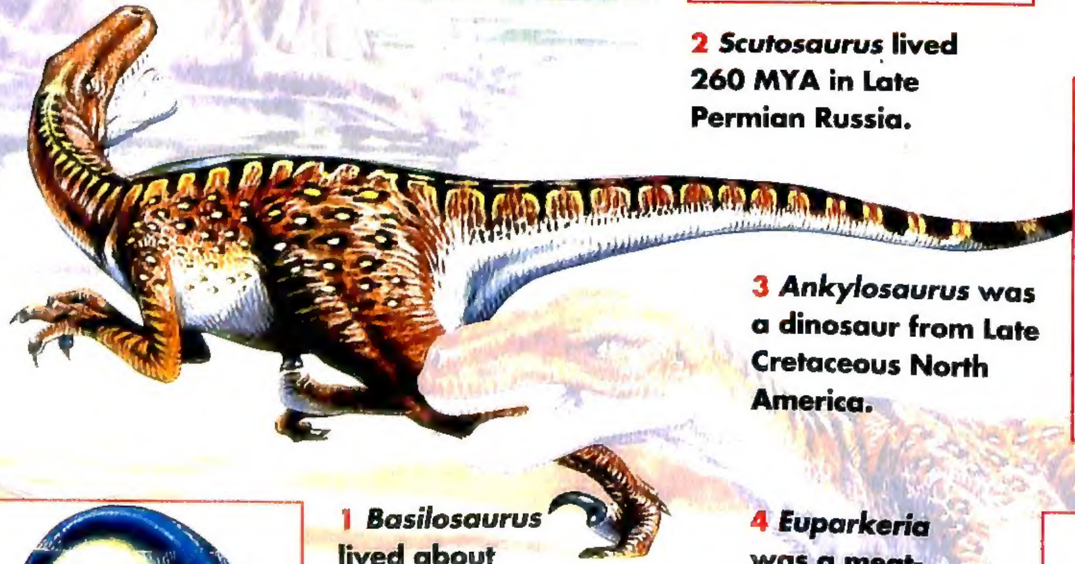
Which of these creatures had a noisy neighbour called *T rex*?

Dinosaurs existed for about 180 million years, but *T rex* did not appear until the end of this time. Only a few prehistoric animals could ever have seen it.

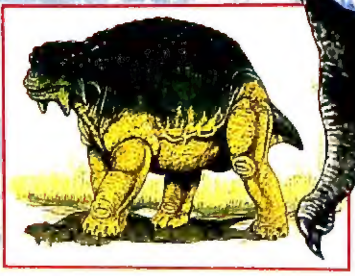
QUIZ TIME

Use your knowledge of prehistoric life to decide which of these creatures became extinct before *T rex* appeared, or only lived after it became extinct. Then work out which creatures lived alongside this mighty beast and were its real neighbours.





1 ***Basilosaurus*** **lived about 54 MYA in the African and North American seas.**

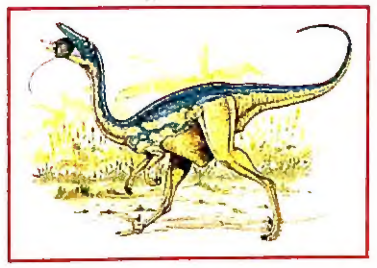


2 ***Scutosaurus*** **lived 260 MYA in Late Permian Russia.**

3 ***Ankylosaurus*** **was a dinosaur from Late Cretaceous North America.**

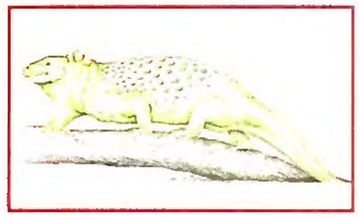
4 ***Euparkeria*** **was a meat-eating reptile from Early Triassic South Africa.**

5 ***Deinogalerix*** **preyed on mammals and lizards in Italy during the Miocene Epoch.**



6 ***Saurornithoides*** **was a bird-like dinosaur that survived until the end of the Age of the Dinosaurs.**

7 ***Centrosaurus*** **was a heavy, armoured dinosaur that lived in Late Cretaceous Canada.**



8 At 3m long, ***Diadectes*** **was one of the biggest land animals alive 270 MYA.**

9 Mammoths appeared on Earth 10 MYA, and died out about 10,000 years ago.

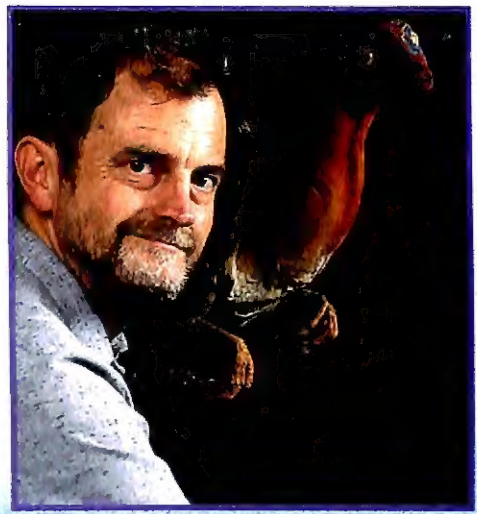
10 ***Desmostylus*** **paddled around the shores of North America about 25 MYA.**

11 ***Quetzalcoatlus*** **lived in Late Cretaceous North America about 67 MYA.**

ANSWERS

T rex lived at the end of the Late Cretaceous Period.

1 Lived after T rex
2 Lived before T rex
3 Lived at the same time
4 Lived before T rex
5 Lived after T rex
6 Lived at the same time
7 Lived at the same time
8 Lived before T rex
9 Lived after T rex
10 Lived after T rex
11 Lived at the same time



Meet the dinosaur man

There are a lot of reptiles in dinosaur expert Dougal Dixon's house. They hang on the walls, peep out from the top of the bookshelves, lurk on the stairs and have the run of the sitting room.

Only one of dino expert Dougal Dixon's reptile collection is alive. This is a Chinese water dragon. The exotic creature lives in the sitting room and likes to scamper up the curtains. The other reptiles are drawings, paintings and models created by Dougal himself.

ALL-ROUNDER

Dougal Dixon is one of those rare people who are all-rounders. He is a scientist, but he also draws, paints, makes models, writes and lectures. He uses all these talents in his work as an expert on dinosaurs and prehistoric animals.

PAINTING THE PAST

To a geologist or palaeontologist, rocks are the books in which the history of the world is written. Scientists like Dougal can turn a layer of dull Cretaceous rock into a brilliant scene of life 70 million years ago, complete with dinosaurs, insects and plants. "You need to use an awful lot of imagination to describe how things were," says Dougal, "but you need a lot of hard scientific fact – including botany, zoology and geology – as well."

DINOSAUR STRIP

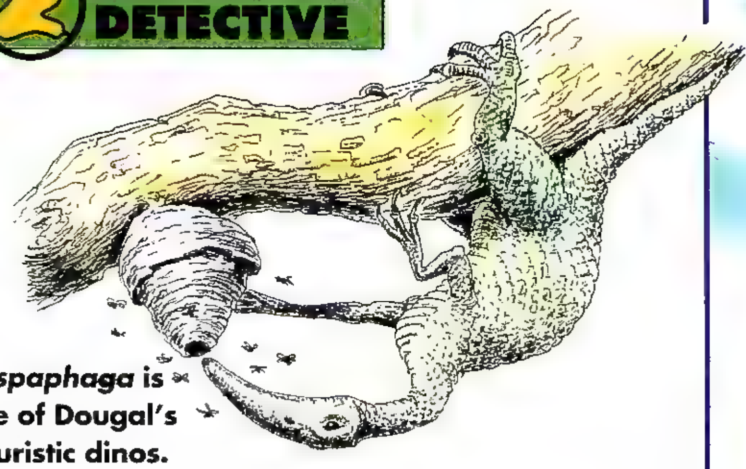
He saw his first dinosaur in a comic when he was five years old. He asked his dad what it was and was shown a Victorian natural history book. "From that moment," says Dougal, "I never looked back; I preferred to read these old books to anything else, even though they were written in rather grand scientific language and I only understood about one word in three!"

ROCK KNOWLEDGE

It was his enthusiasm for dinosaurs that led him to study science at school and geology at university, as well as teaching himself about animals and palaeontology.

ART AND SCIENCE

When he graduated he wanted a job that used all his talents. One day he saw an advert for a geologist to work on an encyclopedia. It seemed ideal and Dougal got the job. "It was while I was working on the project that I realised not all experts are good at explaining their ideas, so I began to do lots of writing too."



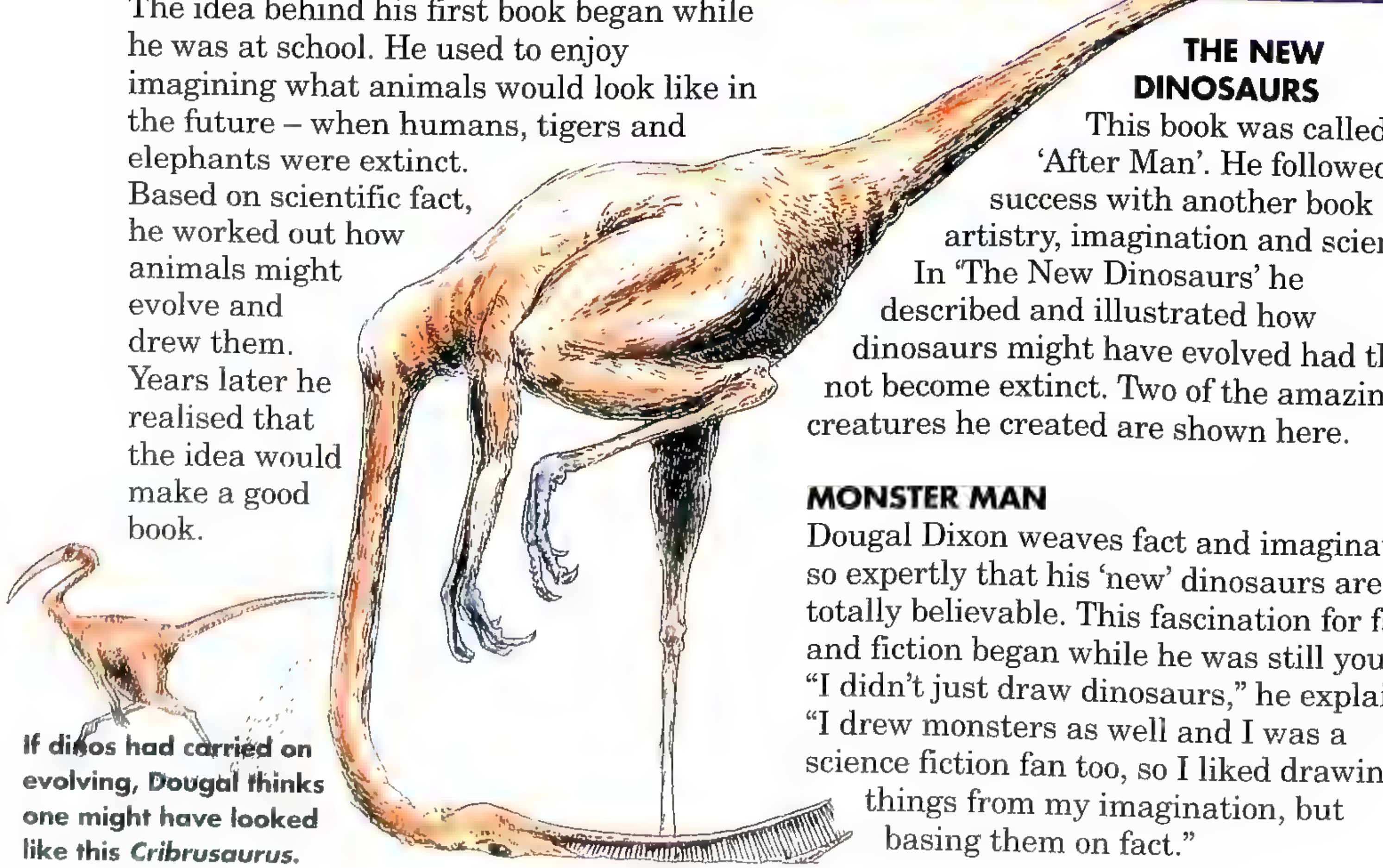
***Vespaphaga* is one of Dougal's futuristic dinos.**

AWARD-WINNING BOOKS

Dougal Dixon's award-winning books are found on bookshelves all over the world. His scientific knowledge, combined with an artist's ability to imagine the animals as if they were alive, has made dinosaurs spring to life for thousands of children from Europe to America and Australia. He also writes for adults and has had about 60 books published altogether.

FACT AND FICTION

The idea behind his first book began while he was at school. He used to enjoy imagining what animals would look like in the future – when humans, tigers and elephants were extinct. Based on scientific fact, he worked out how animals might evolve and drew them. Years later he realised that the idea would make a good book.



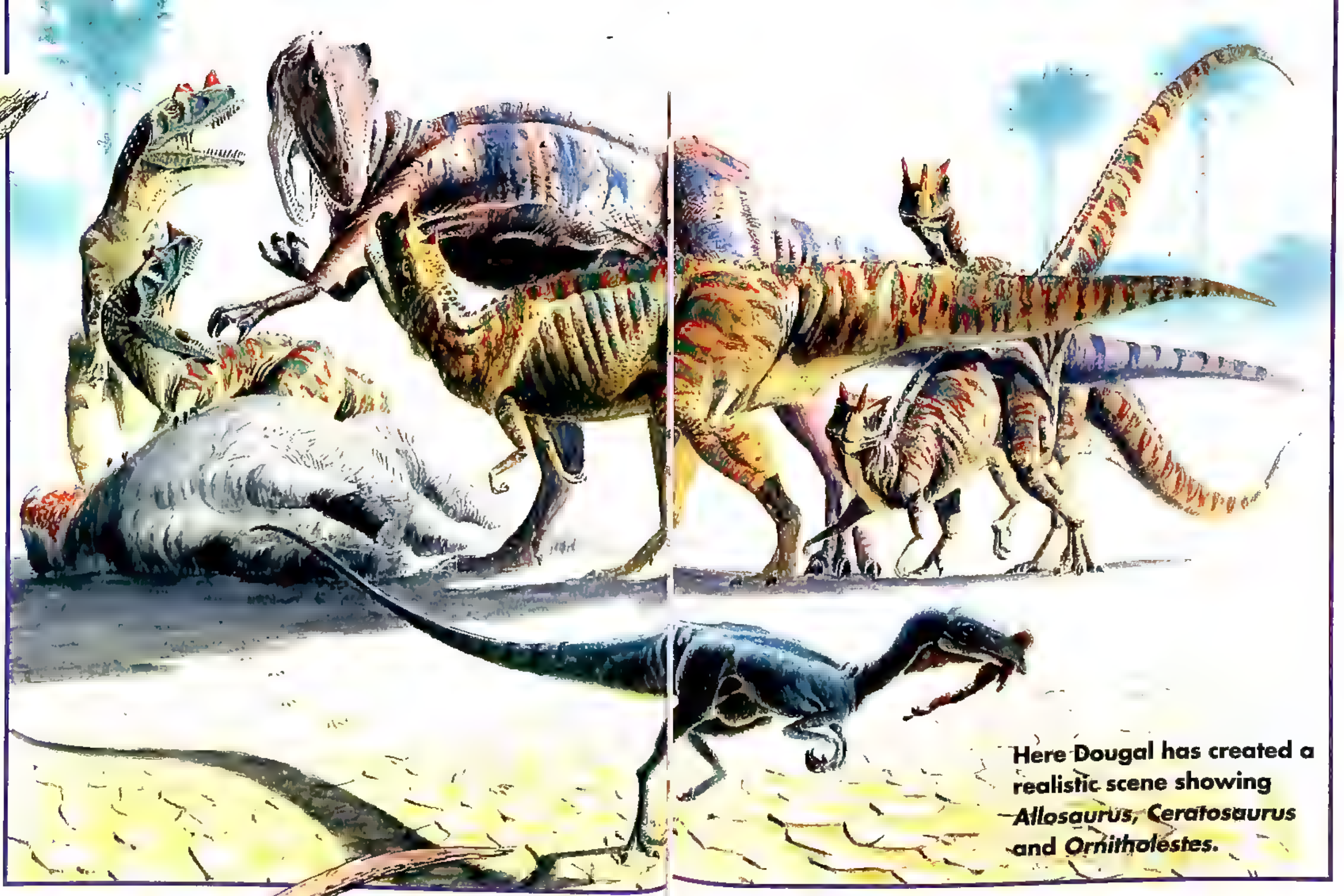
If dinos had carried on evolving, Dougal thinks one might have looked like this *Cribrusaurus*.

THE NEW DINOSAURS

This book was called 'After Man'. He followed its success with another book of artistry, imagination and science. In 'The New Dinosaurs' he described and illustrated how dinosaurs might have evolved had they not become extinct. Two of the amazing creatures he created are shown here.

MONSTER MAN

Dougal Dixon weaves fact and imagination so expertly that his 'new' dinosaurs are totally believable. This fascination for fact and fiction began while he was still young. "I didn't just draw dinosaurs," he explains, "I drew monsters as well and I was a science fiction fan too, so I liked drawing things from my imagination, but basing them on fact."



Here Dougal has created a realistic scene showing *Allosaurus*, *Ceratosaurus* and *Ornitholestes*.

SCIENCE FICTION AND FILM

Dougal is still a science fiction fan and belongs to a society that meets regularly to discuss the latest science fiction books, ideas and films. They are making an animated film which Dougal is directing. His interest in films has led to another of his hobbies. Together with a group from his home town in Dorset, England, he runs the local cinema. The building is more than 100 years old and still has the original gas lamps.

DINOSAUR TRAVELLER

Dougal also keeps up-to-date with new research and information about dinosaurs. "It's very important to keep up with what's going on in the science world, so I attend conventions around the world to meet palaeontologists and hear about their work." He travels all over Europe, often visits Japan and regularly gives lectures to children in the USA.

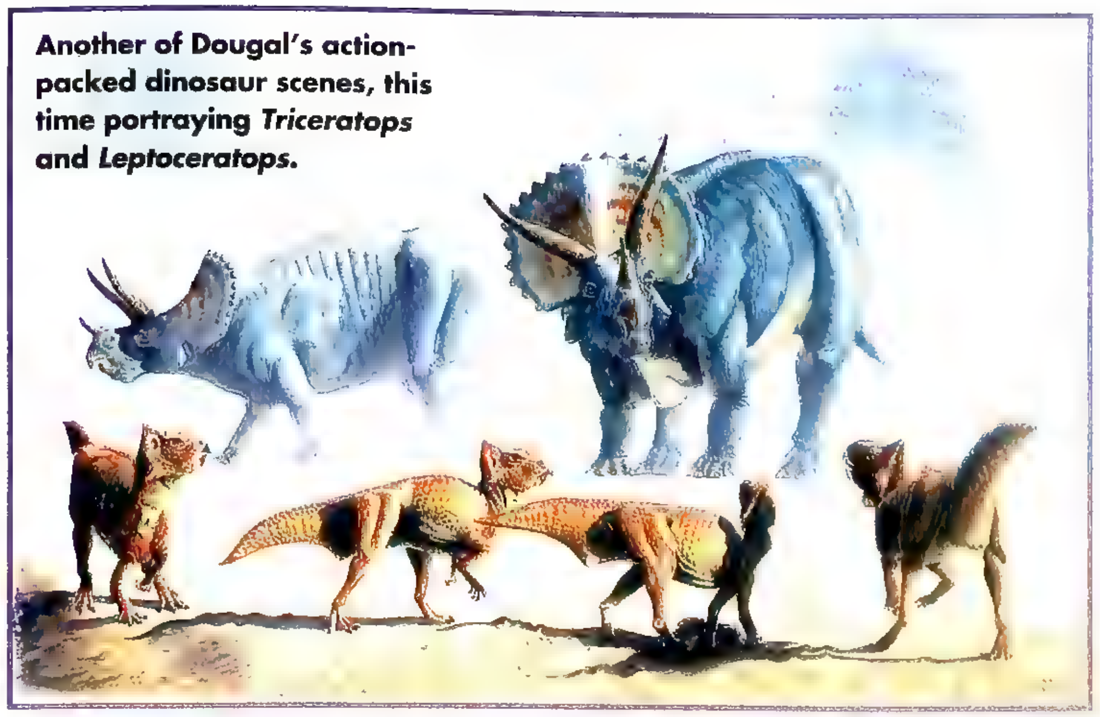
PET DINOSAUR

To help bring dinosaurs to life for these 10-year-old Americans he has made a life-like model of *Troodon*, which is nicknamed Trudy. You can see her behind Dougal's picture on the first page of this article. Trudy is like a giant bendy toy. She is life-size and perfect in every detail, from her large eyes to her elegant tail.

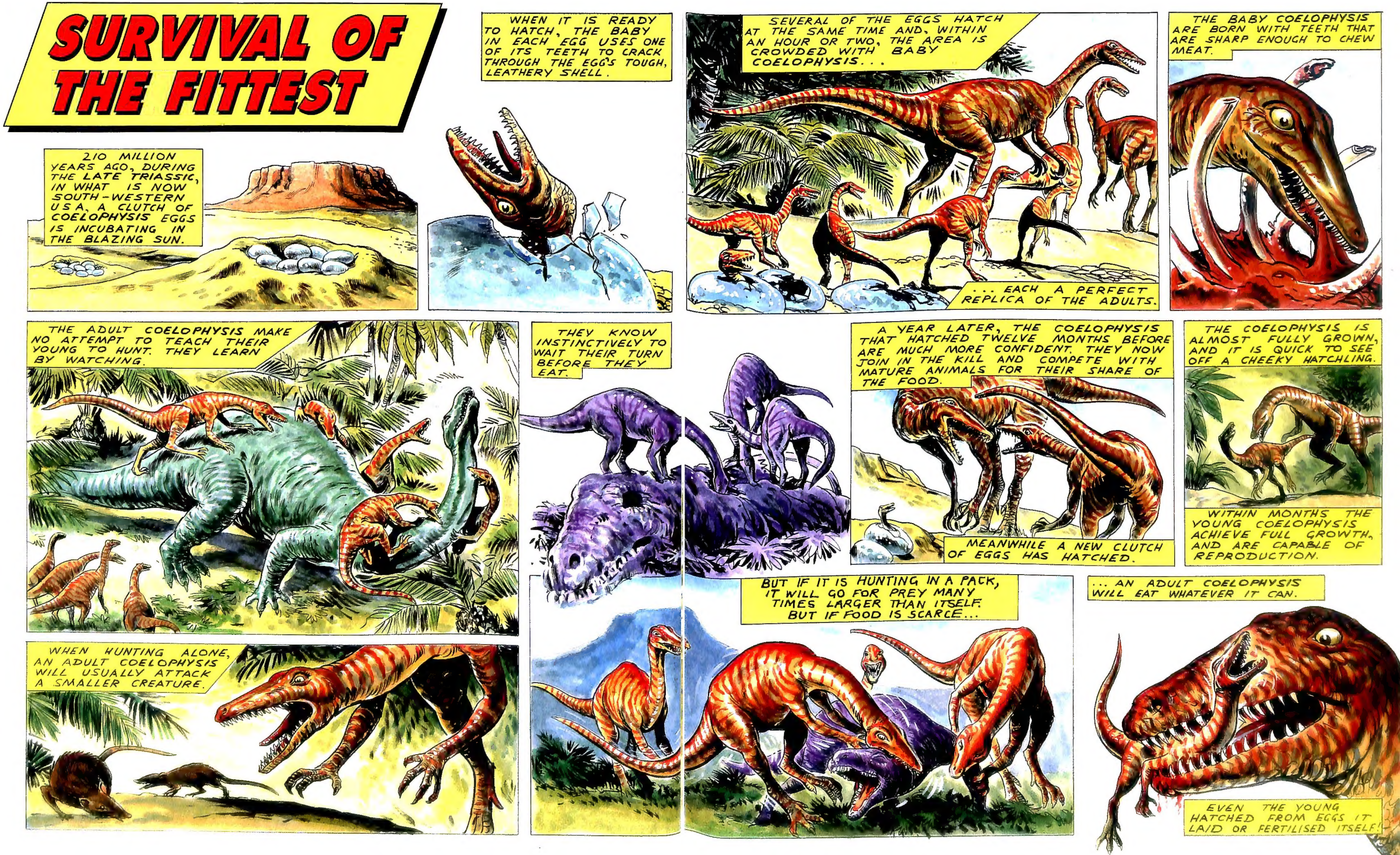
THE GOOD LIFE

If you ask Dougal Dixon what he likes best of all the things he does, he shakes his head and smiles. "I love it all," he says. "It may sound a bit smug, but I can't think of anything I'd rather be doing."

Another of Dougal's action-packed dinosaur scenes, this time portraying *Triceratops* and *Leptoceratops*.



SURVIVAL OF THE FITTEST


210 MILLION YEARS AGO, DURING THE LATE TRIASSIC, IN WHAT IS NOW SOUTH-WESTERN U.S.A., A CLUTCH OF COELOPHYSIS EGGS IS INCUBATING IN THE BLAZING SUN.
WHEN IT IS READY TO HATCH, THE BABY IN EACH EGG USES ONE OF ITS TEETH TO CRACK THROUGH THE EGG'S TOUGH, LEATHERY SHELL.
SEVERAL OF THE EGGS HATCH AT THE SAME TIME AND, WITHIN AN HOUR OR TWO, THE AREA IS CROWDED WITH BABY COELOPHYSIS...
... EACH A PERFECT REPLICA OF THE ADULTS.
THE BABY COELOPHYSIS ARE BORN WITH TEETH THAT ARE SHARP ENOUGH TO CHEW MEAT.
THE ADULT COELOPHYSIS MAKE NO ATTEMPT TO TEACH THEIR YOUNG TO HUNT. THEY LEARN BY WATCHING.
THEY KNOW INSTINCTIVELY TO WAIT THEIR TURN BEFORE THEY EAT.
A YEAR LATER, THE COELOPHYSIS THAT HATCHED TWELVE MONTHS BEFORE ARE MUCH MORE CONFIDENT. THEY NOW JOIN IN THE KILL AND COMPETE WITH MATURE ANIMALS FOR THEIR SHARE OF THE FOOD.
MEANWHILE A NEW CLUTCH OF EGGS HAS HATCHED.
THE COELOPHYSIS IS ALMOST FULLY GROWN, AND IT IS QUICK TO SEE OFF A CHEEKY HATCHLING.
WITHIN MONTHS THE YOUNG COELOPHYSIS ACHIEVE FULL GROWTH, AND ARE CAPABLE OF REPRODUCTION.
WHEN HUNTING ALONE, AN ADULT COELOPHYSIS WILL USUALLY ATTACK A SMALLER CREATURE.
BUT IF IT IS HUNTING IN A PACK, IT WILL GO FOR PREY MANY TIMES LARGER THAN ITSELF. BUT IF FOOD IS SCARCE...
... AN ADULT COELOPHYSIS WILL EAT WHATEVER IT CAN.
EVEN THE YOUNG HATCHED FROM EGGS IT LAID OR FERTILISED ITSELF!

Improve and test your knowledge with...

FACT FILE

Fascinating facts to read and 10 fun questions to answer!

1 What kind of dinosaur was *Afrovenator?*
a) an allosaur
b) a tyrannosaur
c) a stegosaur

2 Which creature had *T rex* for a neighbour?
a) *Basilosaurus*
b) *Ankylosaurus*
c) *Diadectes*

3 What is another name for an ornithomimosaur?
a) a horned dinosaur
b) a penguin dinosaur
c) an ostrich dinosaur

4 When did North America have the most dinosaurs?
a) in the Cretaceous
b) in the Jurassic
c) in the Triassic

5 *Coelophysis* was a:
a) meat-eater
b) fish-eater
c) plant-eater

6 Where was the stegosaur *Chialingosaurus* found?
a) in England
b) in China
c) in Japan

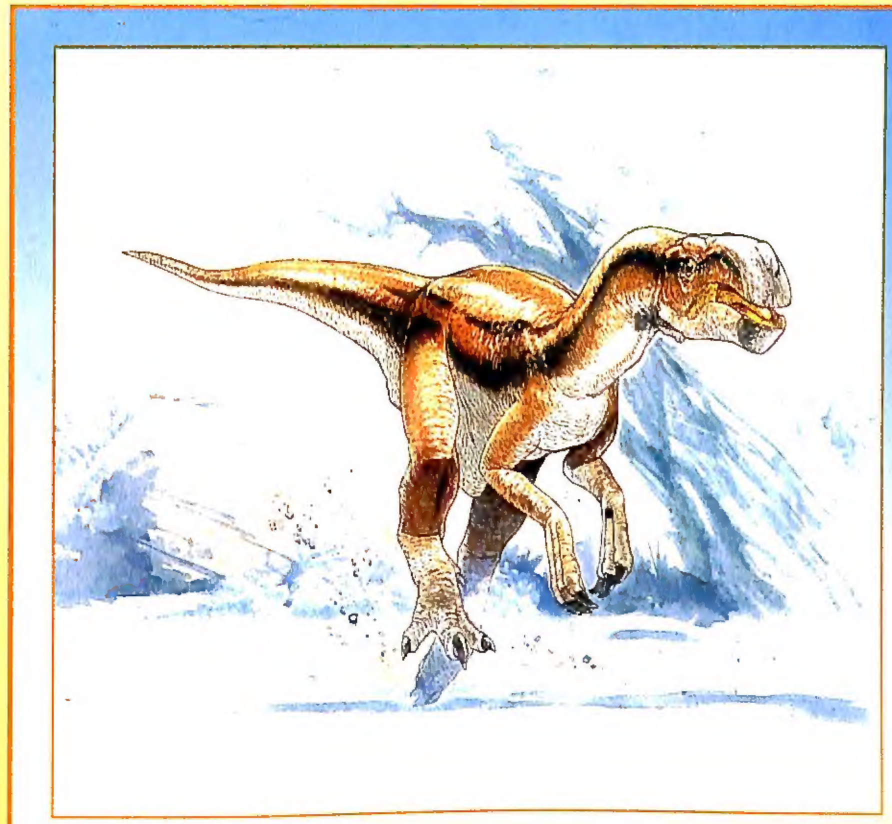
7 Which creature do experts think is the missing link between dinosaurs and birds?
a) *Archaeopteryx*
b) *Ichthyornis*
c) *Mononykus*

8 *Teleoceras* was related to a:
a) hippopotamus
b) rhinoceros
c) dog

9 What kind of dinosaur is Dougal Dixon's Trudy?
a) a *Triceratops*
b) a *Tyrannosaurus rex*
c) a *Troodon*

All in the family

Baby plesiosaurs, only 25cm long, have been found in Late Cretaceous rocks in North America. Scientists think these marine reptiles gave birth to live young, and that they lived in family groups.



Little egg-hunter

Conchoraptor is known only from its tiny skull. When it was first found, scientists thought that it was a baby Oviraptor. It looked just like a miniature version of that dinosaur. It did not have Oviraptor's crest, but usually only adult animals have crests.

Too slow for me!

Barnum Brown was told about some sauropod bones found on a ranch in Wyoming, USA. After a week of excavating, the ranch owner became impatient with the diggers and had to be held back when he tried to finish the dig himself – with a pickaxe!

Dinosaur graveyard

There are bone beds in Alberta, Canada, made up of the remains of thousands of ceratopians. They probably died when the dinosaurs were migrating across rivers. Nearly all of them were adults.

Young fossil-hunter

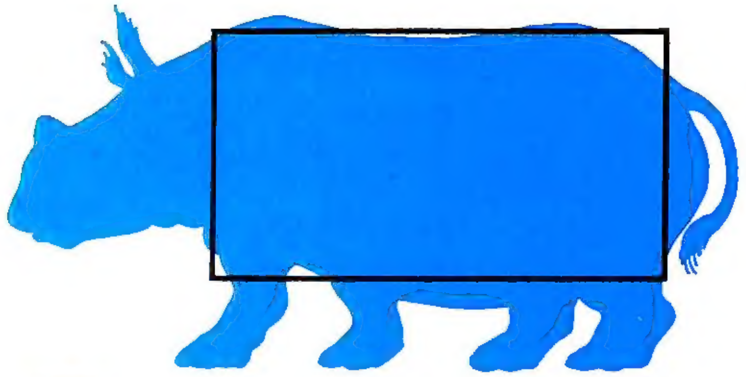
A French man called d'Orbigny was the first palaeontologist to travel to distant places to study fossils 'on site'. He was only 24 years old when he set off on a long, treacherous journey around South America in 1826.

10 What does the name *Dinohyus* mean?
a) 'terrible pig'
b) 'dinosaur pig'
c) 'dinosaur house'

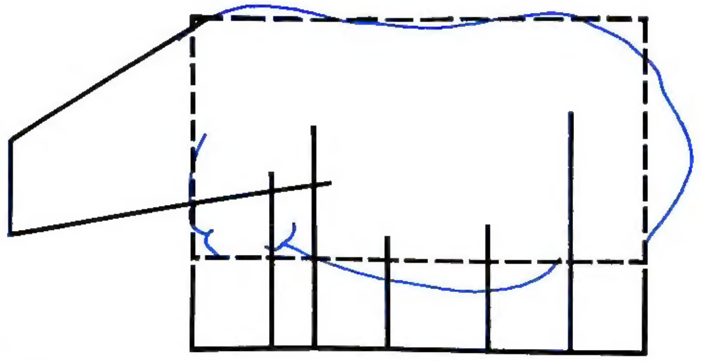
Answers to the questions on inside back cover

TELEOCERAS

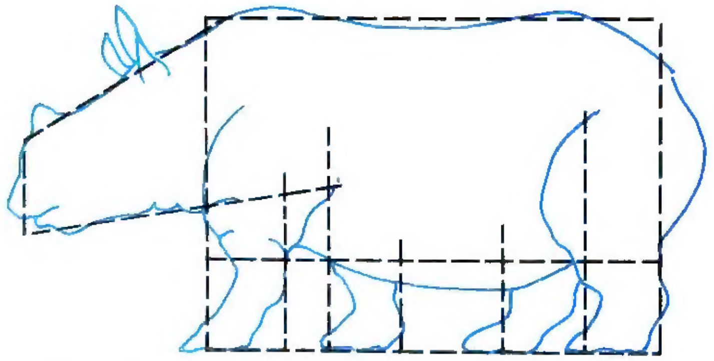
1 Look at the basic shape of *Teleoceras*. From side on, this bulky creature has a big, rectangle-shaped body. Lightly draw this shape in the middle of your piece of paper.



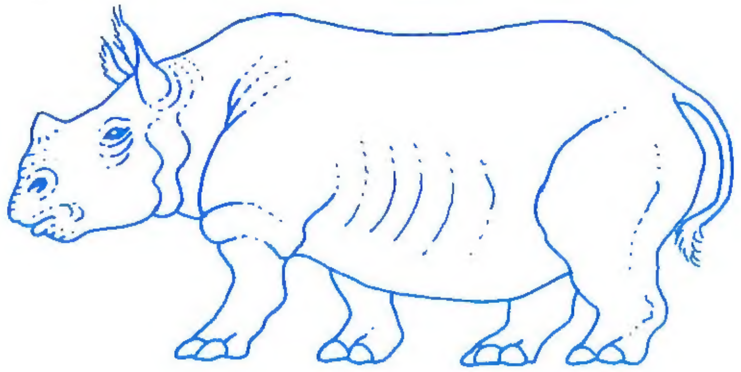
2 Extend the rectangle downwards. Draw guidelines for the stumpy legs inside this extra part. Put in a guideline for the head and start rounding out the body shape.



3 Finish *Teleoceras*' outline by following the guidelines you created in steps 1 and 2. Don't forget details such as the ears and the small horn on its nose.



4 Add the tail and use dotted lines for details of the skin's texture. *Teleoceras*' feet are divided into three hoofed toes. When the outline is finished, colour it in.



Fact box

Teleoceras is a relative of today's rhinoceros.

- **NAME:** *Teleoceras* (tee-lee-oh-ser-as) means 'long and horned'
- **GROUP:** mammal
- **SIZE:** 4m long
- **FOOD:** plants
- **LIVED:** in the Late Eocene to Early Miocene in North America

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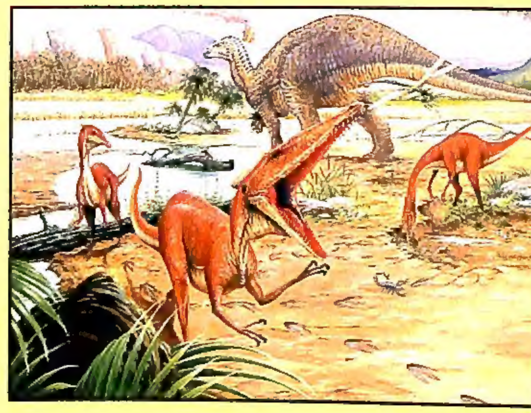

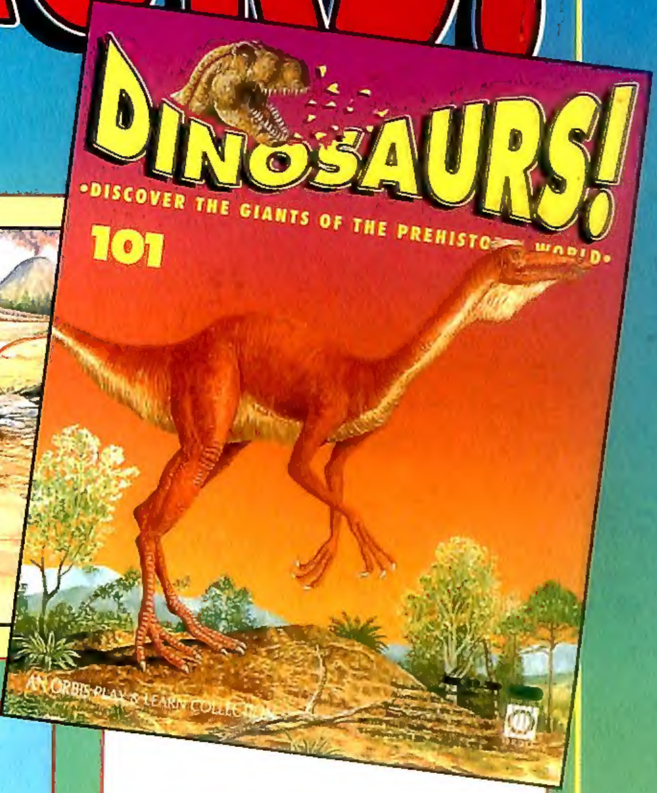
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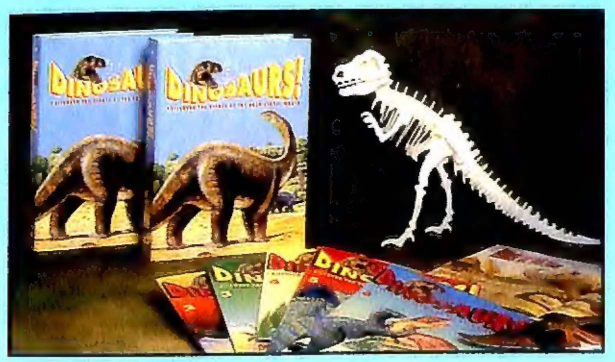

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ANSWERS TO FACT FILE QUESTIONS: 1.a 2.b 3.c 4.a 5.a 6.b 7.c 8.b 9.c 10.a

ASK THE EXPERT

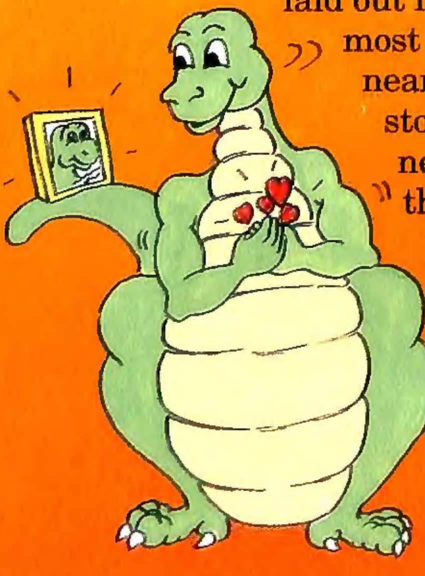
Dr David Norman of Cambridge University answers your dinosaur questions

What did dinosaurs smell like?

Unfortunately, we have no idea what dinosaurs smelled like. This is another of the things that we do not, and probably never will, know about them. At a guess, I would imagine that some dinosaurs smelled hardly at all and others were real stinkers, but I have no idea which were which!

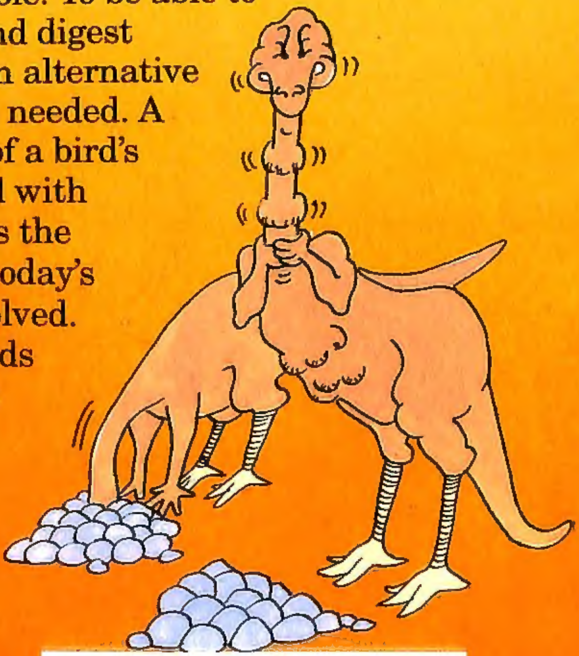
Do we really know how the heart, lungs, stomach and guts were arranged inside a dinosaur?

We do not know exactly how the body parts of any dinosaur were arranged. We can make a good guess at the general layout, however. The body parts of animals with backbones, including humans, are laid out in a standard way in most cases. The lungs are near the front, the heart, stomach and liver are near the middle, and the rest of the guts are just behind. Using this knowledge, we can make a guess about dinosaurs, but it may not be totally accurate.



Did bird mimic dinosaurs swallow stones to help digest their food?

There is no fossil proof to confirm the idea that ornithomimosaurs, the proper name for bird mimic or ostrich dinosaurs, swallowed pebbles as today's ostriches do. Just like ornithomimosaurs, ostriches and all other birds do not have any teeth in their jaws. This means that anything birds eat, unless it is very soft, has to be swallowed whole. To be able to break down and digest tough foods, an alternative set of 'teeth' is needed. A gizzard (part of a bird's stomach) lined with sharp stones is the solution that today's birds have evolved. Given that birds and dinosaurs are closely related, it does not seem unreasonable to suggest that some dinosaurs also had a gizzard.



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